PREPARATION

You will need a LaunchPad. Run the Lab9 starter file in the simulator and on the real board just to make sure the configurations are correct. The graders should run, but return scores of 0.

STARTER PROJECT

Lab9_FunctionalDebugging

PURPOSE

In Lab09 you will learn about time delays, arrays and functional debugging. The data you collect will be physical proof that the system operates within specifications.

SYSTEM REQUIREMENTS

The Lab9 starter project is the same as **C9_Debugging** example but includes the connections to the Lab9 grader. You will make three changes. First, make the LED flash at 10 Hz. In other words, make it turn on for 0.05 seconds, and then turn off for 0.05 seconds. Second, make the LED flash if either switch SW1 or SW2 are pressed (this means either PF4 or PF0 is 0). The means toggle if just SW1 is pressed, just SW2 is pressed or both switches are pressed. Third, record PortF bits 4,1,0 every time the input changes or the output changes. For example, if your system detects a change in either PF4 or PF0 input, record PortF bits 4,1,0. If your system causes a change in PF1, record PortF bits 4,1,0. In order for the grading engine to see/grade your data, please leave the debugging array defined exactly as it is in the starter project.

```
unsigned long Data[50];
```

Your system will be graded on its ability to satisfy the following requirements.

- If both PF4 and PF0 switch are not pressed, the PF1 output should be low.
- If either PF4 or PF0 switches is pressed, the output toggles at 10 Hz (±10%).
- Information collected in the **Data** array matches the I/O on PortF.
- 50 data points are collected only on a change in input or a change in output. (i.e., no adjacent elements in the array are equal).

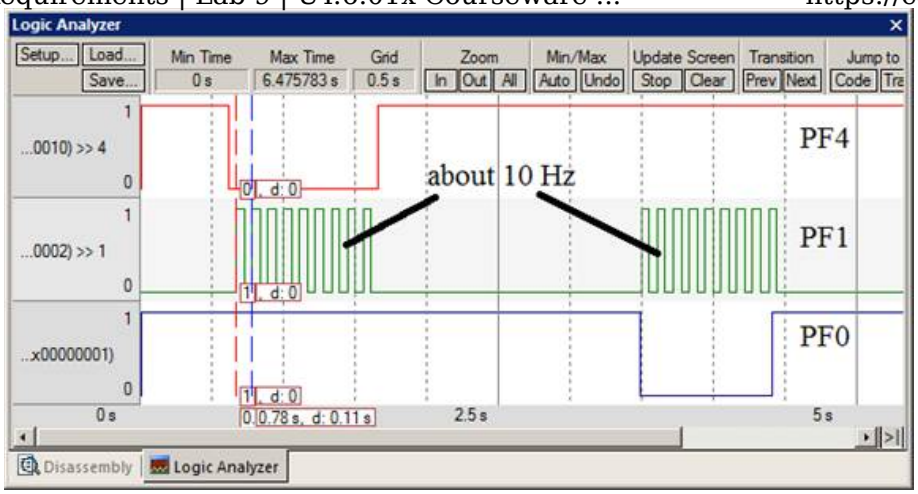

Figure 9.1. Logic analyzer output showing PF1 toggles at 10 Hz whenever PF0 or PF4 is low. If both PF0 and PF4 are high, then the output PF1 should be low.

The grader will activate the PLL so the system runs at 80 MHz. You must not modify this rate.

WORKING LAB 9

Help

DR. RAMESH YERRABALLI: In this video, we'll demonstrate the working of Lab 9.

We run our program.

And what we see is in Lab 9, we have instrumentation data

that we're collecting, which is in this array called Data,

and it captures the state of Switch 1, Switch 2, and an LED.

So let's add it to the watch window, and

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